

THE ANIMALS OF BRITAIN AND THEIR ORIGIN.

*The History of the European Fauna.* By R. F. Scharff, B.Sc., Ph.D., F.Z.S. Pp. vii + 364; illustrated. (London: Walter Scott, Ltd., 1899.)

THE title that we have chosen for this review of Dr. Scharff's volume is really rather more expressive of the scope of the book than is his own title. For he deals at greater length with the fauna of our own country than with that of Europe in general. This is by no means a defect to be urged in considering his statements and arguments; on the contrary, we think that it will add to the interest of the book; and besides Great Britain has a fauna which practically only differs from that of adjacent parts of Europe in its poverty. The reduction of the number of individuals and of species of indigenous creatures was set down by Mr. Wallace to the recent glaciation of these islands, which, occurring, as it was supposed to do, after the land connection with Europe had been broken through, destroyed many forms coming originally from more southern regions. The severance of the land connections hindered a repopulation when more favourable climatic conditions were re-established. Dr. Scharff is one of those who do not believe in great possibilities of migration over stretches of sea for purely terrestrial animals. There are of course such cases on record; but they are really not numerous. Dr. Scharff mentions several that are of recent occurrence. He tells us that Colonel Fielden, when in the Barbadoes, witnessed, or heard of, the arrival of an alligator which must have traversed a tract of ocean of 250 miles. There are also well-known experiments which show that animals *might* be imported in a natural way from distant and transpontine countries. The resistance of certain snails and other molluscs to the effects of sea-water when guarded by their diaphragm has been proved by the classical experiments of Darwin. It is, however, disappointing to learn from Dr. Scharff how dangerous it is to argue from experiments which can so readily be made to the actual phenomena of nature.

Concerning one of these protected and—as it was thought—adventurous molluscs, the author writes as follows:—

"The fact that *Cyclostoma elegans* does not live in Ireland is of particular interest in connection with the floating-theory just quoted, as on all sides of Ireland dead specimens have been picked up on the shore, showing that marine currents carry specimens, and have thus transported them for countless centuries. Nevertheless, the species has not established itself in Ireland."

Equally strong arguments can be derived from the study of other islands, from which a species, that ought to be there, as it were, is unaccountably absent. It has always appeared to the present writer that in deducing results from the faunas of oceanic islands which must have been stocked *de novo* from adjacent mainlands too little weight has been given to involuntary introduction by man. There is no doubt whatever that emigrating man has been a most fell agent in the destruction of faunas by the deliberate introduction of domestic and other animals; it is also probable that much has been done in the way of accidental introduction. There is,

however, another possibility—urged by Dr. Scharff himself elsewhere in his volume—that may account for a given species not succeeding in establishing itself in a country which appears to be ideal for its needs. There may be no room for it; the ground may be taken up by an allied form or a creature of similar needs and habits. Here again the problem is indefinitely complicated by human occupation and tillage—in the case of the countries which form the subject of Dr. Scharff's remarks. Another matter of wide zoo-geographical interest, as well as vital to the development of his argument, is dealt with by Dr. Scharff. The peopling of these islands has, he thinks, mainly at least occurred along land routes; but how is it to be decided whence a given animal started in its wanderings towards the British Islands?

The author gives an example where a fair guess may be made as to the original home of the genus.

"The badger," he observes, "inhabits Europe and Northern Asia. It is absent apparently from many parts of Central Asia, but it appears again further south in Palestine, Syria, Persia, Turkestan, and Thibet. West Central Asia would be about the centre of its range. That this corresponds to its place of origin is indicated by the fact that the only three other species of badgers known, viz., *M. anakuma*, *M. leucurus*, and *M. albogularis*, are confined to Asia. If we examine the fossil history of the genus, we find that the two most ancient instances of the existence of badgers have been discovered in Persia, where *M. Polaki* and *M. maraghanus* occur in Miocene deposits."

Failing future discoveries of fossil badgers, this method of argument seems to be valid. But it is not so clear to us that Dr. Scharff is justified in stating that the centre of distribution, *i.e.* the original home of the genus, is to be sought for where the number of species of the genus is at a maximum. There are more species of the Tapir (*Tapirus*) in America than in Asia, where there is only one. But it is doubtful as to whether the genus is of American origin; it is much more probably European. So, too, with the cat tribe; the species of *Felis* abound in Asia and the East generally, and are fairly numerous in America, but Europe again would seem to be the place of dispersal.

From these general considerations, which are put forward with clearness and supported by a proper treatment, so far as we can judge, of the geological evidence, the author proceeds to discuss in detail the actual homes of our British animals, laying most stress upon, or at least dealing more at length with, the mammalia. Naturally this is the most important group in attacking the problem, since our acquaintance with fossil invertebrates, and even of other vertebrates, is less extensive. The fauna of this country, as everybody knows, is a mixture of various and apparently incongruous elements.

The facts brought forward by Dr. Scharff show incidentally how very little influence temperature seems to have, and to have had, in the limiting or encouraging the migrations of mammalia. The tiger barred and the leopard are at home in tropical forests and in the colder regions of Asia. The polar bear, *par excellence* an Arctic animal, endures with comfort the temperature of London in the summer—and, indeed, more than endures it—as is shown by the fact that an individual lived for thirty-seven years in the Zoological Society's gardens. Dr.

Scharff distinguishes three main lines of migration to these islands—the Siberian, the Arctic (which he carefully separates), and finally the Oriental. Besides these three trunk routes, so to speak, a considerable quota of our fauna has arrived here from such centres of dispersal as the Lusitanian area. It is often put forward that the fauna of Europe show more likenesses to that of Africa than to that of Asia—"Oriental" Asia, that is to say. Dr. Scharff does not omit to notice this view, but will not allow an African origin for any part of our fauna. On the contrary, he is disposed to think that the spreading of animals has been in a exactly opposite direction, and that Africa has been partly peopled from Europe.

We can distinctly commend this book, which is agreeable reading as well as a repertory of important facts. Its value is considerably increased by a short summary at the end of each chapter of the line of argument pursued and the results arrived at. Numerous engravings and maps, all of them in the text, add to its usefulness; while a selected bibliography will enable the non-expert reader to pursue his inquiries further into any particular matter not treated at length in Dr. Scharff's book.

F. E. B.

#### OUR BOOK SHELF.

*Le Cidre.* Par X. Rocques. Pp. 171. (Paris: Gauthier-Villars, 1899.)

In a country where the technical difficulties of the wine-grower and the brewer have been considered worthy of the attention of such a man as Pasteur, it is not surprising that the cider-maker should receive help from science. That this is so, is rendered very evident by M. Rocques in the small volume before us, where we find in a condensed, but very readable form, an account of the valuable aid French men of science are giving to the cider industry. In England we are, of course, behindhand in such a matter, but there is, perhaps, some excuse in this case, as cider has not the economic importance here that it possesses in France. In that country, where the mean annual consumption of cider is twelve million hectolitres, representing one-fifth of the alcoholic beverages consumed, economic considerations affecting its production are naturally very great, and the importance of scientific help proportionately large.

But, according to the author, one point in connection with the cider industry tends to hinder somewhat the adoption of scientific methods by the manufacturers, and this is the remarkable fluctuations in the apple crop compared with the fluctuations in the other leading agricultural crops of France. The proportion of the minimum wheat crop to the maximum is 1 to 1½, and of wine, 1 to 2; but in the case of cider there is the very great difference of 1 to 8½. It appears, in fact, on taking the average of the last twenty-five years as a guide, that a good apple crop can only be expected one year in two. Such uncertainty in the crop, no doubt, tends to hinder rapid progress in the art of cider-making; but, on the other hand, progress is assisted by the growing custom of establishing well equipped breweries, which are supplied with apples from the smaller growers who previously made their own cider on a small scale with poor appliances, and in the old rule of thumb style.

About 40 per cent. of the total production of cider in France is now made in these breweries, much to the comfort and advantage of the consumer, who is not provided by nature with a stomach equal to the action of the acid liquid so often produced by the small farmer.

In the cider breweries working on a sufficiently large scale to permit the adoption of suitable plant and skilled supervision, scientific methods appear to be adopted freely. The diffusion method, employed so largely in the beet-sugar industry, is utilised for the extraction of apple-juice for the production of certain classes of cider, but the old method of extraction by pressure is still found desirable for full-flavoured, sweet ciders, the diffusion process producing a beverage of a drier character.

Hansen's well-known researches on the pure culture and selection of yeasts, which influence so largely the zymo-technical processes of to-day, are also made use of by the advanced cider-maker for the purpose of improving his produce. A composite yeast of the well-known organism, *Saccharomyces apiculatus*, together with another selected yeast derived from the apple, *S. Mali*, is found to give good results. As apple-juice, unlike a beer wort, cannot be sterilised by heat in order to provide a clear field for the development of a selected yeast culture, the plan adopted is to nurse the selected yeast growth to such a vigorous state that when used it is capable of crowding out the undesirable *saccharomyces* naturally present in the apple-juice.

For the purpose of improving and increasing the flavour of cider, an interesting use is also made of Jacquemin's researches, by which he showed that various parts of certain plants, including the apple, contain glucosides capable of being split up by fermentative action into sugar, and principles possessing the characteristic bouquet of the fruit used.

We recommend M. Rocques' little volume to all interested in technical cider-making, and also to those interested generally in zymo-technical literature.

A. J. B.

*Liverpool School of Tropical Diseases. Memoir I. "Instructions for the Prevention of Malarial Fever."* (Liverpool: University Press, 1900.)

THIS booklet is the first of a series of memoirs to be issued by the Liverpool School of Tropical Medicine, and is the outcome of the malaria expedition sent out by that body to Sierra Leone. It deals with measures of prevention suggested by observations made on the spot in a malarious country and with the light of modern theory as to the cause of the disease. There are two drawings of the innocent and noxious mosquito which cannot help but impress the imagination of the reader. The idea of alertness and viciousness suggested by the attitude of the latter should make the most careless observer interested in noting which genus of mosquito it is that infects his neighbourhood.

The memoir, which is clearly and concisely written, contains most valuable information for any one living in the tropics. It is artistically got up, and reflects credit on the school and on the University Press of Liverpool, of which it is one of the first productions.

*Our Insect Friends and Foes: how to Collect, Preserve and Study them.* By Belle S. Cragin, A.M. Pp. vi + 377. With 255 illustrations. (New York and London: G. P. Putnam's Sons, Knickerbocker Press, 1899.)

THE title of the work is likely to give the impression that it is devoted to economic entomology, whereas it is professedly a text-book on general entomology and "relations of insects," spiders, scorpions, &c., dealing with the common species of all orders found in "the States east of the Rocky Mountains and north of the Gulf States," including useful instructions on collecting, rearing and preserving insects, their anatomy, &c. The book is written almost expressly for young people, who will find it interesting and instructive in many ways. Unfortunately, many of the illustrations are very poor indeed, and this particularly applies to the *Hymenoptera*.